Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy in a reaction chamber made at least of quartz material, comprising:

a first step of reacting a solid Al with a halogenated hydrogen at a temperature of from 300°C to 650°C to produce a halogenated product of Al, wherein the first step occurs in a first reaction zone of the reaction chamber; and

a second step of reacting the halogenated product of Al produced in the first step with a gas containing a group V element on the surface of a substrate crystal so as to grow a III-V group compound semiconductor on the substrate crystal, wherein the second step occurs in a second reaction zone of the reaction chamber.

2. (Previously Presented) A method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy in a reaction chamber made at least of quartz material, comprising:

a first step of reacting a solid mixture of group III metals including Al with a halogenated hydrogen at a temperature of from 300°C to 650°C to produce a halogenated product of group III, wherein the first step occurs in a first reaction zone of the reaction chamber; and

a second step of reacting the halogenated product of group III produced in the first step with a gas containing a group V element on the surface of a substrate crystal so as to grow a III-V group compound semiconductor on the substrate crystal, wherein the second step occurs in a second reaction zone of the reaction chamber.

3. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 1, wherein the halogenated hydrogen is hydrogen chloride, hydrogen bromide, or hydrogen iodide.

4. (Previously Presented) A method for producing an Al-containing III-V group compound semiconductor in a reaction chamber made at least of quartz material by repeating a vapor phase epitaxial growth process to deposit layers of III-V group compound semiconductors of different compositions containing Al as a group III element, the method comprising:

a first step of reacting a solid Al with a halogenated hydrogen at a temperature of from 300°C to 650°C to produce an halogenated product of Al, wherein the first step occurs in a first reaction zone of the reaction chamber; and

a second step of reacting the halogenated product of Al produced in the first step with a gas containing a group V element on the surface of a substrate crystal so as to grow a III-V group compound semiconductor on the substrate crystal, wherein at least one of the amount of the halogenated hydrogen used in the first step, the amount of a carrier gas for the halogenated hydrogen used in the first step, and the amount of the group V element-containing gas used in the second step is varied to deposit III-V group compound semiconductors having different compositions, wherein the second step occurs in a second reaction zone of the reaction chamber.

5. (Previously Presented) A method for producing an Al-containing III-V group compound semiconductor in a reaction chamber made at least of quartz material by repeating a vapor phase epitaxial growth process to deposit layers of III-V group compound

semiconductors of different compositions containing Al as a group III element, the method comprising:

a first step of reacting a solid mixture of group III metals including Al with a halogenated hydrogen at a temperature of from 300°C to 650°C to produce a halogenated product of Al, wherein the first step occurs in a first reaction zone of the reaction chamber; and

a second step of reacting the halogenated product of Al and the halogenated product of group III metals other than Al produced in the first step with a gas containing a group V element on the surface of a substrate crystal so as to grow a III-V group compound semiconductor on the substrate crystal in the vapor phase, wherein at least one of the amount of the halogenated hydrogen used in the first step, the amount of a carrier gas for the halogenated hydrogen used in the first step, and the amount of the group V element-containing gas used in the second step is varied to deposit III-V group compound semiconductors having different compositions, wherein the second step occurs in a second reaction zone of the reaction chamber.

6. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 4, wherein the halogenated hydrogen is hydrogen chloride, hydrogen bromide, or hydrogen iodide, and the carrier gas for the halogenated hydrogen is hydrogen, an inert gas, or a mixture of hydrogen and an inert gas.

7-11. (Canceled)

12. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 2, wherein the halogenated hydrogen is hydrogen chloride, hydrogen bromide, or hydrogen iodide.

13. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 5, wherein the halogenated hydrogen is hydrogen chloride, hydrogen bromide, or hydrogen iodide, and the carrier gas for the halogenated hydrogen is hydrogen, an inert gas, or a mixture of hydrogen and an inert gas.

14-17. (Canceled)

18. (Previously Presented) A method for growing a crystal of AlN semiconductor by vapor phase epitaxy according to claim 1, wherein the second step comprises reacting the halogenated product of Al produced in the first step with a gas containing N.

19. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 1, wherein the second reaction zone is maintained at a temperature of 700°C to 1300°C.

20. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 2, wherein the second reaction zone is maintained at a temperature of 700°C to 1300°C.

21. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 4, wherein the second reaction zone is maintained at a temperature of 700°C to 1300°C.

22. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 5, wherein the second reaction zone is maintained at a temperature of 700°C to 1300°C.

23. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor according to claim 3, wherein the halogenated hydrogen is hydrogen chloride.

24. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 6, wherein the halogenated hydrogen is hydrogen chloride.

25. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor according to claim 12, wherein the halogenated hydrogen is hydrogen chloride.

26. (Previously Presented) The method for producing an Al-containing III-V group compound semiconductor according to claim 13, wherein the halogenated hydrogen is hydrogen chloride.

27.-31. (Canceled)

32. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 1,

wherein the halogenated product of Al is $AlCl_3$ and the gas containing group V element is NH_3.

33. (Previously Presented) The method for growing a crystal of an Al-containing III-V group compound semiconductor containing Al as a group III element by vapor phase epitaxy according to claim 1,

wherein the second step of reacting the halogenated product of Al produced in the first step with a gas containing a group V element is conducted at a temperature greater than 900°C.